

Rhuddlan Castle – Modern Repair Preserves Old Fortress



A range of vacuum injection techniques and innovative use of fibre reinforced polymer anchors used to stabilise 800 year old historic castle.

Client	CADW Welsh Historic Monuments
Consultant	High-Point Rendel
Principal Contractor	Balvac
Contract Value	£ 488,000
Programme	4 Phases: 1999 to 2002



Rhuddlan Castle is situated on the banks of the River Clywd, 2 miles inland from the coastal town of Rhyl. It has a long history dating back to the 13th Century and for the past three hundred years Rhuddlan has served as a ready source for local building materials. Strong coastal winds have further contributed to weathering the weakened sandstone walls.



Development of the repair and impregnation programme was carefully developed by the site team and approved by CADW's conservation and archaeological specialists. A programme of testing, trials and sampling ensured full awareness of the systems prior to the works.



Cracked lintel stones above window openings were pinned following resin injection to prevent the further ingress of water and to provide lateral support for the stone.



In order to stabilise individual weak and weathered stones, the surface has been vacuum flushed with a low viscosity sealant material. This technique utilises a sealing shroud spaced off the substrate surface and resin introduced under vacuum to penetrate into the substrate

The holes for the anchors were cored using 25mm diameter diamond tipped core barrels varying in lengths from 500mm up to 2000mm. Installation of fibre reinforced polymer anchors bonded with polymer resin has physically tied loose masonry in place and together with vacuum assisted resin injection, composite repairs have been achieved.

The joints in masonry were pointed up with a lime mortar and the surrounding stone filled through injection tubes with resin. The stones were then impregnated with a low viscosity resin.

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